What is claimed is:

1. An operation control method in a fuel injection device comprising: a high-pressure pump that pressure-sends a fuel in a fuel tank; a common rail in which the fuel pressure-sent by the high-pressure pump is temporarily stored;

5 a plurality of injection nozzles attached to the common rail, each having a solenoid valve; a low-pressure control solenoid valve provided between the fuel tank and the high-pressure pump; a high-pressure control solenoid valve provided in an area from the high-pressure pump up to the injection nozzles; and a control unit that controls operations of the high-pressure pump, the

10 respective solenoid valves of the plural injection nozzles, the low-pressure control solenoid valve, and the high-pressure control solenoid valve,

the method being so configured that, when a pressure in the common rail exceeds a predetermined value in a state in which the high-pressure control solenoid valve is driven to control the pressure in the common rail, a

15 driving current determined by a prescribed value map defining a correlation between the pressure in the common rail and the driving current of the high-pressure control solenoid valve is corrected based on an actual pressure in the common rail and a driving current of the high-pressure control solenoid valve at the actual pressure, and the corrected driving current is passed to the high-

20 pressure control solenoid valve.

2. An operation control method in a fuel injection device comprising: a high-pressure pump that pressure-sends a fuel in a fuel tank; a common rail in which the fuel pressure-sent by the high-pressure pump is temporarily stored;

25 a plurality of injection nozzles attached to the common rail, each having a solenoid valve; a low-pressure control solenoid valve provided between the fuel tank and the high-pressure pump; a high-pressure control solenoid valve provided in an area from the high-pressure pump up to the injection nozzles; and a control unit that controls operations of the high-pressure pump, the

30 respective solenoid valves of the plural injection nozzles, the low-pressure

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control solenoid valve, and the high-pressure control solenoid valve,

the method being so configured that, when an engine is in a predetermined start-up state, the high-pressure control solenoid valve is controlled to be driven until a predetermined period of time passes after the engine is activated, thereby controlling a pressure in the common rail.

3. An operation control method in a fuel injection device comprising: a high-pressure pump that pressure-sends a fuel in a fuel tank; a common rail in which the fuel pressure-sent by the high-pressure pump is temporarily stored; a plurality of injection nozzles attached to the common rail, each having a solenoid valve; a low-pressure control solenoid valve provided between the fuel tank and the high-pressure pump; a high-pressure control solenoid valve provided in an area from the high-pressure pump up to the injection nozzles; and a control unit that controls operations of the high-pressure pump, the respective solenoid valves of the plural injection nozzles, the low-pressure control solenoid valve, and the high-pressure control solenoid valve,

the method being so configured that, when an absolute value of a variation amount of a pressure in the common rail exceeds a predetermined value, the high-pressure control solenoid valve is controlled to be driven, thereby controlling the pressure in the common rail.

4. An operation control method in a fuel injection device comprising: a high-pressure pump that pressure-sends a fuel in a fuel tank; a common rail in which the fuel pressure-sent by the high-pressure pump is temporarily stored; a plurality of injection nozzles attached to the common rail, each having a solenoid valve; a low-pressure control solenoid valve provided between the fuel tank and the high-pressure pump; a high-pressure control solenoid valve provided in an area from the high-pressure pump up to the injection nozzles; and a control unit that controls operations of the high-pressure pump, the respective solenoid valves of the plural injection nozzles, the low-pressure

control solenoid valve, and the high-pressure control solenoid valve,

the method being so configured that, when a fluctuation of a driving torque of the high-pressure pump exceeds a predetermined state, the high-pressure control solenoid valve is controlled to be driven, thereby controlling a pressure in the common rail.

5.   An operation control method in a fuel injection device comprising: a high-pressure pump that pressure-sends a fuel in a fuel tank; a common rail in which the fuel pressure-sent by the high-pressure pump is temporarily stored; a plurality of injection nozzles attached to the common rail, each having a solenoid valve; a low-pressure control solenoid valve provided between the fuel tank and the high-pressure pump; a high-pressure control solenoid valve provided in an area from the high-pressure pump up to the injection nozzles; and a control unit that controls operations of the high-pressure pump, the respective solenoid valves of the plural injection nozzles, the low-pressure control solenoid valve, and the high-pressure control solenoid valve,

the method being so configured that, when an average driving torque of the high-pressure pump exceeds a predetermined state, the low-pressure control solenoid valve is controlled to be driven, thereby controlling a pressure in the common rail.

6.   An operation control method in a fuel injection device comprising: a high-pressure pump that pressure-sends a fuel in a fuel tank; a common rail in which the fuel pressure-sent by the high-pressure pump is temporarily stored; a plurality of injection nozzles attached to the common rail, each having a solenoid valve; a low-pressure control solenoid valve provided between the fuel tank and the high-pressure pump; a high-pressure control solenoid valve provided in an area from the high-pressure pump up to the injection nozzles; and a control unit that controls operations of the high-pressure pump, the respective solenoid valves of the plural injection nozzles, the low-pressure

control solenoid valve, and the high-pressure control solenoid valve,

the method being so configured that, when a fuel temperature is in a predetermined high-temperature state and the high-pressure control solenoid valve is being driven, the low-pressure control solenoid valve is controlled to be driven in place of driving the high-pressure control solenoid valve, until the fuel temperature falls within a predetermined reference temperature range, thereby controlling a pressure in the common rail, whereas,

when the fuel temperature is in a predetermined low-temperature state and the low-pressure control solenoid valve is being driven, the high-pressure control solenoid valve is controlled to be driven in place of driving the low-pressure control solenoid valve, until the fuel temperature falls within the predetermined reference temperature range, thereby controlling the pressure in the common rail.

7.   An operation control method in a fuel injection device comprising: a high-pressure pump that pressure-sends a fuel in a fuel tank; a common rail in which the fuel pressure-sent by the high-pressure pump is temporarily stored; a plurality of injection nozzles attached to the common rail, each having a solenoid valve; a low-pressure control solenoid valve provided between the fuel tank and the high-pressure pump; a high-pressure control solenoid valve provided in an area from the high-pressure pump up to the injection nozzles; and a control unit that controls operations of the high-pressure pump, the respective solenoid valves of the plural injection nozzles, the low-pressure control solenoid valve, and the high-pressure control solenoid valve,

the method being so configured that, when the fuel injection device is in a predetermined unstable operation state, the high-pressure control solenoid valve is controlled to be driven, thereby controlling a pressure in the common rail.

8.   A fuel injection device comprising: a high-pressure pump that

pressure-sends a fuel in a fuel tank; a common rail in which the fuel pressure-sent by said high-pressure pump is temporarily stored; a plurality of injection nozzles attached to said common rail, each having a solenoid valve; a low-pressure control solenoid valve provided between said fuel tank and said high-pressure pump; a high-pressure control solenoid valve provided in an area from said high-pressure pump up to said injection nozzles; and a control unit that controls operations of said high-pressure pump, the respective solenoid valves of said plural injection nozzles, said low-pressure control solenoid valve, and said high-pressure control solenoid valve,

wherein said control unit is so configured to control said low-pressure control solenoid valve and said high-pressure control solenoid valve to be selectively driven based on a temperature of the fuel, a pressure in said common rail, an engine rotation speed, an accelerator depression amount, and position information of an ignition engine key that are inputted from an external part, and has a prescribed value map stored therein that defines correlation between the pressure in said common rail and a driving current of said high-pressure control solenoid valve, and

in controlling said high-pressure control solenoid valve to be driven,

said control unit determines the driving current of said high-pressure control solenoid valve for a desired pressure in said common rail based on the prescribed value map and passes the determined driving current to said high-pressure control solenoid valve until the pressure in said common rail is judged to exceed a predetermined variation amount, whereas,

when the pressure in said common rail is judged to exceed a predetermined value, said control unit corrects the driving current determined by the prescribed value map based on an actual pressure in said common rail and the driving current of said high-pressure control solenoid value at the actual pressure, and passes the corrected driving current to said high-pressure control solenoid value.

9. A fuel injection device comprising: a high-pressure pump that pressure-sends a fuel in a fuel tank; a common rail in which the fuel pressure-sent by said high-pressure pump is temporarily stored; a plurality of injection nozzles attached to said common rail, each having a solenoid valve; a low-pressure control solenoid valve provided between said fuel tank and said high-pressure pump; a high-pressure control solenoid valve provided in an area from said high-pressure pump up to said injection nozzles; and a control unit that controls operations of said high-pressure pump, the respective solenoid valves of said plural injection nozzles, said low-pressure control solenoid valve, and said high-pressure control solenoid valve,

wherein said control unit is so configured to control said low-pressure control solenoid valve and said high-pressure control solenoid valve to be selectively driven based on a temperature of the fuel, a pressure in said common rail, an engine rotation speed, an accelerator depression amount, and position information of an ignition engine key that are inputted from an external part, and

as a result of judgment on whether or not an engine is in a predetermined start-up state,

when the engine is judged to be in the predetermined start-up state, said control unit controls said high-pressure control solenoid valve to be driven until a predetermined period of time passes after the engine is activated, whereas,

when the engine is judged not to be in the predetermined start-up state, said control unit drives said low-pressure control solenoid valve.

10. A fuel injection device comprising: a high-pressure pump that pressure-sends a fuel in a fuel tank; a common rail in which the fuel pressure-sent by said high-pressure pump is temporarily stored; a plurality of injection nozzles attached to said common rail, each having a solenoid valve; a low-pressure control solenoid valve provided between said fuel tank and said

high-pressure pump; a high-pressure control solenoid valve provided in an area from said high-pressure pump up to said injection nozzles; and a control unit that controls operations of said high-pressure pump, the respective solenoid valves of said plural injection nozzles, said low-pressure control

5   solenoid valve, and said high-pressure control solenoid valve,

wherein said control unit is so configured to control said low-pressure control solenoid valve and said high-pressure control solenoid valve to be selectively driven based on a temperature of the fuel, a pressure in said common rail, an engine rotation speed, an accelerator depression amount, and

10   position information of an ignition engine key that are inputted from an external part, and

as a result of judgment on whether or not an absolute value of a variation amount of the pressure in said common rail exceeds a predetermined value,

15   when the absolute value of the variation amount of the pressure in said common rail is judged to exceed the predetermined value, said control unit controls said high-pressure control solenoid valve to be driven, whereas,

when the absolute value of the variation amount of the pressure in said common rail is judged not to exceed the predetermined value, said control

20   unit controls said low-pressure control solenoid valve to be driven.

11.   A fuel injection device comprising: a high-pressure pump that pressure-sends a fuel in a fuel tank; a common rail in which the fuel pressure-sent by said high-pressure pump is temporarily stored; a plurality of injection

25   nozzles attached to said common rail, each having a solenoid valve; a low-pressure control solenoid valve provided between said fuel tank and said high-pressure pump; a high-pressure control solenoid valve provided in an area from said high-pressure pump up to said injection nozzles; and a control unit that controls operations of said high-pressure pump, the respective

30   solenoid valves of said plural injection nozzles, said low-pressure control

solenoid valve, and said high-pressure control solenoid valve,

wherein said control unit is so configured to control said low-pressure control solenoid valve and said high-pressure control solenoid valve to be selectively driven based on a temperature of the fuel, a pressure in said common rail, an engine rotation speed, an accelerator depression amount, and position information of an ignition engine key that are inputted from an external part, and

as a result of judgment on whether or not a fluctuation of a driving torque of said high-pressure pump exceeds a predetermined state,

when the fluctuation of the driving torque of said high-pressure pump is judged to exceed the predetermined state, said control unit controls said high-pressure control solenoid valve to be driven, whereas,

when the fluctuation of the driving torque of said high-pressure pump is judged not to exceed the predetermined state, said control unit controls said low-pressure control solenoid valve to be driven.

12.   A fuel injection device comprising: a high-pressure pump that pressure-sends a fuel in a fuel tank; a common rail in which the fuel pressure-sent by said high-pressure pump is temporarily stored; a plurality of injection nozzles attached to said common rail, each having a solenoid valve; a low-pressure control solenoid valve provided between said fuel tank and said high-pressure pump; a high-pressure control solenoid valve provided in an area from said high-pressure pump up to said injection nozzles; and a control unit that controls operations of said high-pressure pump, the respective solenoid valves of said plural injection nozzles, said low-pressure control solenoid valve, and said high-pressure control solenoid valve,

wherein said control unit is so configured to control said low-pressure control solenoid valve and said high-pressure control solenoid valve to be selectively driven based on a temperature of the fuel, a pressure in said common rail, an engine rotation speed, an accelerator depression amount, and

position information of an ignition engine key that are inputted from an external part, and

as a result of judgment on whether or not an average driving torque of said high-pressure pump exceeds a predetermined state,

when the average driving torque of said high-pressure pump is judged to exceed the predetermined state, said control unit controls said low-pressure control solenoid valve to be driven, whereas,

when the average driving torque of said high-pressure pump is judged not to exceed the predetermined state, said control unit controls said high-pressure control solenoid valve to be driven.

13.   A fuel injection device comprising: a high-pressure pump that pressure-sends a fuel in a fuel tank; a common rail in which the fuel pressure-sent by said high-pressure pump is temporarily stored; a plurality of injection nozzles attached to said common rail, each having a solenoid valve; a low-pressure control solenoid valve provided between said fuel tank and said high-pressure pump; a high-pressure control solenoid valve provided in an area from said high-pressure pump up to said injection nozzles; and a control unit that controls operations of said high-pressure pump, the respective solenoid valves of said plural injection nozzles, said low-pressure control solenoid valve, and said high-pressure control solenoid valve,

wherein said control unit is so configured to control said low-pressure control solenoid valve and said high-pressure control solenoid valve to be selectively driven based on a temperature of the fuel, a pressure in said common rail, an engine rotation speed, an accelerator depression amount, and position information of an ignition engine key that are inputted from an external part, and

as a result of judgment on whether or not a temperature of the fuel is in a predetermined high temperature state,

when the temperature of the fuel is judged to be in the predetermined

high temperature state, said control unit judges whether or not said high-pressure control solenoid valve is being driven, and when said high-pressure control solenoid valve is judged to be in the driven state, said control unit controls said low-pressure control solenoid valve to be driven in place of

5 driving said high-pressure control solenoid valve, until the temperature of the fuel falls within a predetermined reference temperature range, while, when said high-pressure control solenoid valve is judged not to be in the driven state, said control unit controls said low-pressure control solenoid valve to be driven until the temperature of the fuel falls within the predetermined

10 reference temperature range, whereas,

when the temperature of the fuel is judged not to be in the predetermined high temperature state, said control unit judges whether or not the temperature of the fuel is in a predetermined low temperature state, and when the temperature of the fuel is judged to be in the predetermined low

15 temperature state, said control unit judges whether or not said low-pressure control solenoid valve is being driven, and when the low-pressure control solenoid valve is judged to be in the driven state, said control unit controls said high-pressure control solenoid valve to be driven in place of driving said low-pressure control solenoid valve until the temperature of the fuel falls

20 within the predetermined reference temperature range, while, when said low-pressure control solenoid valve is judged not to be in the driven state, said control unit controls said high-pressure control solenoid valve to be driven until the temperature of the fuel falls within the predetermined reference temperature range.

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14. A fuel injection device comprising: a high-pressure pump that pressure-sends a fuel in a fuel tank; a common rail in which the fuel pressure-sent by said high-pressure pump is temporarily stored; a plurality of injection nozzles attached to said common rail, each having a solenoid valve; a low-

30 pressure control solenoid valve provided between said fuel tank and said

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high-pressure pump; a high-pressure control solenoid valve provided in an area from said high-pressure pump up to said injection nozzles; and a control unit that controls operations of said high-pressure pump, the respective solenoid valves of said plural injection nozzles, said low-pressure control

5　solenoid valve, and said high-pressure control solenoid valve,

wherein said control unit is so configured to control said low-pressure control solenoid valve and said high-pressure control solenoid valve to be selectively driven based on a temperature of the fuel, a pressure in said common rail, an engine rotation speed, an accelerator depression amount, and

10　position information of an ignition engine key that are inputted from an external part, and

as a result of judgment on whether or not a state of fuel injection control is a predetermined unstable operation state,

when the state of the fuel injection control is judged to be the

15　predetermined unstable operation state, said control unit controls said high-pressure control solenoid valve to be driven, whereas,

when the state of the fuel injection control is judged not to be the predetermined unstable operation state, said control unit controls said low-pressure control solenoid valve to be driven.

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